

We claim:

1. A manifold for a heat exchanger, the manifold being formed of a section of one-piece, seamless, and jointless tubing, the manifold having a substantially flat part and a concavely curved part so as to have a substantially D-shaped cross section, with the
- 5 substantially flat part forming a manifold header and the concavely curved part forming a manifold tank, the header having at least two longitudinal external ribs formed on the exterior surface thereof.
2. The manifold of claim 1, wherein the header has a lengthwise center line and the external ribs are positioned symmetrically relative to the center line.
3. The manifold of claim 1, wherein the header has a lengthwise center line and wherein the header has a plurality of tube slots formed therein perpendicular to the center line for the insertion of heat exchanger tubes, and the edges of the external ribs adjoining the tube slots are chamfered.
4. The manifold of claim 1, further having a cladding material applied to at least a portion of the exterior surface thereof.
5. The manifold of claim 4, wherein the cladding material is applied to the exterior of the header.

6. The manifold of claim 4, wherein the cladding material comprises a self-adhering coating.
7. The manifold of claim 6, wherein the self-adhering coating is an alloy comprising aluminum and silicon.
8. The manifold of claim 7, wherein the alloy further includes zinc.
9. The manifold of claim 1, wherein the manifold header is thicker than the tank.
10. The manifold of claim 3, further having at least one lengthwise internal rib extending along the interior surface of the tank spaced apart from the interior surface of the header to act as stops for the heat exchanger tubes.
11. The manifold of claim 1, wherein the header has a lengthwise center line and wherein the manifold further has cuts formed in the header at either end perpendicular to the center line and baffles inserted into the manifold interior through the cuts to serve as end caps.
12. The manifold of claim 11, wherein each of the baffles has a first portion that substantially conforms in shape to the uncut interior surface of the manifold and a second portion that substantially conforms in shape to the exterior surface of the manifold at the cut.

13. The manifold of 11, wherein the header has a lengthwise center line and wherein the manifold further has at least one cut formed in the header between a pair of adjacent tube slots perpendicular to the center line and a corresponding baffle inserted
- 5 therethrough into the manifold interior to alter the flow path through the manifold, wherein each of the baffles has a first portion that substantially conforms in shape to the uncut interior surface of the manifold and a second portion that substantially conforms in shape to the exterior surface of the manifold at the cut.
14. A method of forming a heat exchanger manifold, comprising the steps of:
- (a) extruding tubing in a one-piece, seamless, jointless shape having a substantially flat part and a concavely curved part so as to have a substantially D-shaped
- 5 cross section and having at least two external ribs extending longitudinally on the exterior of the substantially flat part; and
- (b) following said step (a), cutting the tubing to manifold length to form a manifold having a header and a tank.
15. The method of claim 14, further comprising the step of:
- (c) following said step (b), forming tube slots in the header and chamfering the adjoining edges of the external ribs.

16. The method of claim 14, further comprising the steps of:

(c) forming cuts through the header for the placement of end caps; and

(d) following said step (c), inserting end caps through the cuts in the header formed for the placement thereof.

17. The method of claim 16, further comprising the step of:

(e) following said step (c), applying a cladding material to the exterior of the manifold.

18. The method of claim 16, further comprising the step of:

(e) following said step (d), applying a cladding material to the exterior of the manifold.

19. The method of claim 16, further comprising the step of:

(e) following said step (f), driving the end caps into place.

20. The method of claim 14, further comprising the steps of:

(c) forming cuts through the header for the placement of end caps and at least one baffle; and

5 (d) following said step (c), inserting end caps and at least one baffle through the cuts in the header formed for the placement thereof.

21. The method of claim 20, further comprising the step of:

(e) following said step (d), driving the end caps and the at least one baffle into place.

22. The method of claim 14, wherein said step (b) is carried out by machining.

23. A method of forming a heat exchanger, comprising the steps of:

(a) extruding tubing in a shape having a substantially D-shaped cross-section with a substantially flat part and a substantially semi-circular part and with at least two
5 external ribs extending longitudinally on the exterior of the substantially flat part;

(b) following said step (a), cutting the tubing to manifold length to form a pair of manifolds each having a header and a tank;

(c) following said step (b), forming tube slots in the headers and chamfering the adjoining edges of the external ribs;

10 (d) forming cuts through the headers for the placement of end caps;

(e) following said step (d), inserting end caps through the cuts in the headers formed for the placement thereof; and

(f) following said step (e), assembling heat exchanger tubes and fins to the manifolds.

24. The method of claim 23, further comprising the step of:

(g) following said step (d) and prior to said step (e), applying a cladding material to the exteriors of the manifolds; and

5 (h) following said step (g), brazing the assembled manifolds, heat exchanger tubes, and fins to form a heat exchanger.